

# NINa-News

Wir fördern Wirtschaft



EU.SH



Landesprogramm Wirtschaft: Gefördert durch die Europäische Union - Europäischer Fonds für regionale Entwicklung (EFRE), den Bund und das Land Schleswig-Holstein  
Schleswig-Holstein. Der echte Norden.

## North German Initiative Nanotechnology SH

### No. 9 | April 2019

## Dear Reader,



Werner Kässens

Germany needs a structural change away from traditional industry towards the knowledge and technology oriented lines of business of the future. This change will be driven by innovation.

It is our task as an economic development promoter

to cope with this structural change on a regional level to make the economy of the city of Kiel fit for future.

Nanotechnology plays a key role in this challenge as it is a driver for innovation. It can be beneficial in various industries thanks to its technological width. Thus, we promote the knowledge transfer from research institutions into companies, for example by taking part in NINa SH's board of directors.

The competencies of Kiel University in the field of nanotechnology are regionally and internationally well renowned. The 33,000 students of the four universities in Kiel are an advantage when it comes to innovation in this economic region.

Networking, co-operation and a well working transfer of knowledge are essential for economic success in today's globally linked and complex world. Thus, we are very much looking forward to the parliamentary congress organized by NINa SH and the Department of Commerce and Technology in Berlin on April 10<sup>th</sup>. Experts will present the nanotechnological abilities of the state of Schleswig-Holstein on a federal level.

Werner Kässens, managing director of the Wissenschaftszentrum Kiel GmbH and the Kieler Wirtschaftsförderungs- und Strukturentwicklungs GmbH

## Parliamentary congress on nanotechnology in Berlin

**NINa SH and the Department of Commerce and Technology invite to a parliamentary congress in Berlin on April 10<sup>th</sup> to demonstrate the nanotechnological competencies of the state of Schleswig-Holstein.**

When it comes to nanotechnology, Schleswig-Holstein has a lot on offer - like new micro-implants, innovations for shipbuilding and worldwide acknowledged science on a new class of versatile nanomaterial. Experts from science, industry and politics present latest developments in nanotechnology made in Schleswig-Holstein. The event offers an ideal stage for all involved parties for dialog and networking. Participation is free of charge and applications can be filed via the website of NINa SH.



The event takes place in the representation of the state of Schleswig-Holstein in Berlin

# A center for innovative ideas

The Science Center Kiel offers a central place for the promotion of knowledge transfer and innovation. The center fulfills a key function as an information hub for the topics of the future and for innovation activities.

How are scientific results turned into an innovative company? The [Science Center Kiel](#) aims at the promotion of co-operation between science and industry to create jobs and strengthen the competitiveness of the local economy.

On 2,000 sqm the center accommodates some 20 enterprises with 130 employees from knowledge-intensive industry sectors. Besides its supporting functions, the Science Center Kiel itself offers congresses, informative events and workshops related to innovative topics.

The event area, encompassing 450 sqm, contributes to the lively atmosphere of the building. The modern area can be flexibly arranged to cater for the needs of various events up to 200 participants.

Thanks to its manifold activities the Science Center Kiel makes a major contribution to the attractiveness of the city of Kiel as a place for science and industry.



*The Science Center is the heart of the Science Park Kiel.*

# Innovation from the periphery of nanotechnology



**In the DESY innovation village the lately founded company PiNa-Tec work on replacing the established methods of protein analysis with a procedure based on nanoparticles.**

Why does one take the risk of founding an enterprise? Katja Werner knows her motivation well, "To contribute to science by improving existing analytic procedures considerably."

She pursues her endeavor with her company PiNa-Tec which she describes as a "lean" start-up, aiming at high impact with little tech-

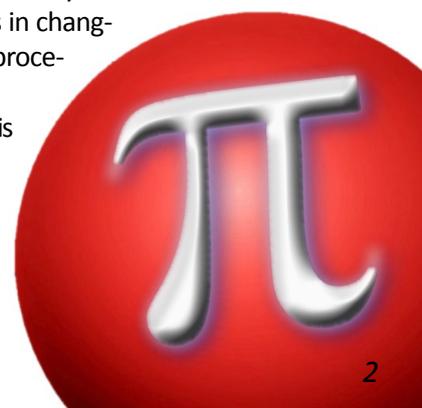
nology. Which is also the origin of her company's name PiNa-Tec, being an abbreviation for "technology from the periphery of nanotechnology" where Ms. Werner locates her business. "A fully optimized high-tech product is worthless if nobody needs it," Ms. Werner explains her approach, which needs only comparably small amounts of gold

nanoparticles between 30 and 50 nanometers.

The PiNa-Tec protein test needs no costly equipment and is considerably faster and more reliable compared to established analytic procedures. The nanoparticles, which are functionalized with specific antibodies, dye a sample within 10 minutes to 2 hours, depending on the sample volume. The result can be read out with the naked eye just like a pregnancy test while established methods like the Western-blot need a luminescence detector. The PiNa-Tec result is also quantitative since the intensity of the coloring depends on the amount of target protein due to saturation of the detection molecules.

Despite of the advantages of her test compared to established methods Ms. Werner has to do some convincing, "Scientists are remarkably conservative since they want to find something new and thus they don't want to put their efforts in changing standard procedures."

However, this cannot impede her business plans, "The founding of the company motivates me a lot," Ms. Werner says.



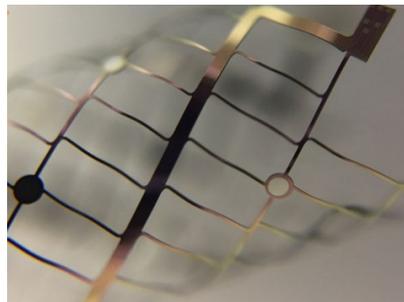
# Implants 2.0

Implants will be able to fulfill more functions than pure mechanical ones in future. The necessary production technology for multifunctional micro-implants is provided by the company [ACQUANDAS](#) from the city of Kiel.

The demand for micro-implants increases drastically due to chronic diseases, the world-wide demographic change and economic constraints. Nitinol has been employed since the 1990s as the most important metallic implant material for stents, neurovascular products for stroke treatment, blood filter and artificial heart valves.

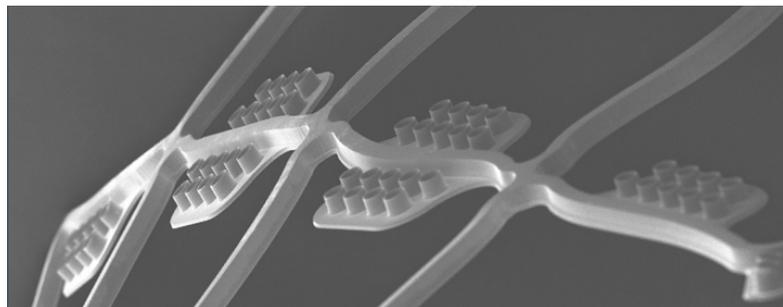
Electronic micro-implants (“bioelectronics”) are predicted to revolutionize future therapies in which intelligent implants interface the peripheral nervous system or substitute drugs. However, to achieve such capabilities new functions aside from mechanical features have to be integrated on a very small scale. The patented production technology of ACQUANDAS enables for the first time the monolithic integration of electrodes, sensors, actuators and other features especially for the development and production of minimal invasive medical products. The process offers manifold possibilities of cost-efficient mass production and miniaturization.

The business idea was awarded the first prize of the



Platform for microelectronics: the technology allows the fabrication of stents with integrated electrodes which are individually controllable.

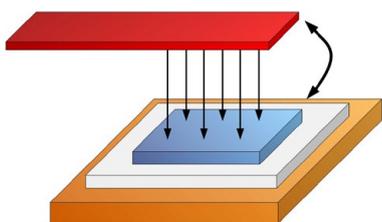
Platform for micro-implants: stent-like structure with integrated drug repositories.



“Idea Competition Health Schleswig-Holstein” in 2009. ACQUANDAS received in 2017 the first prize of the Medtec Europe Start-Up Academy Award “Future Innovation & Technology” and in 2018 the first rank of the Petersen Innovation-Transfer-Prize.

## NINa’s Highlights

On this page, NINa SH presents current highlights from the field of nanotechnology and news from science and industry. You can inform the network about your activities here, too - [send us your highlight](#).



### Nanogenerators improve magnetic field sensors

Magnetic field sensors are important components of many technical and biomedical applications. Scientists from Kiel University improved the energy efficiency and sensitivity of miniaturized magnetic field sensors using the “nanogenerator” principle. They combined an oscillating micro-cantile-

ver, which detects the magnetic field, with the electric field of an electret. This set-up made the sensor more sensitive for low-frequency magnetic fields which are crucial for biomedical applications. The [results of the scientists were published in the journal \*Nano Energy\*](#).



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### Functionalized surfaces against bacteria

Polymers are used in a wide variety of biotechnological applications. However, polymers easily adsorb biomolecules which give rise to severe health risks since they are a nutrient for bacteria. Thus, the [joint research project “SuperContact”](#) aims at the anti-adhesive functionalization of

transparent polymer surfaces. The functional layers will be applied to contact lenses and will be investigated under realistic conditions. In the framework of the project co-operate the university of applied sciences Kiel and the companies [Wöhlk Contactlinsen](#) and [nandatec](#).

### Imprint

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Prof. Franz Faupel  
Lehrstuhl für Materialverbunde  
Institut für Materialwissenschaft  
Kaiserstraße 2  
24143 Kiel, Germany

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